What is claimed is:

1. A telemetry processor for a medical device, comprising:

control logic for operating the telemetry processor according to telemetry parameters;

a data decoder coupled to the control logic and coupleable to a demodulator, the data decoder translates a received serial bit stream into parallel accessible words; and,

a receive buffer coupled to the data decoder and coupleable to a main processor bus

a data encoder coupled to the control logic and coupleable to a modulator, the data encoder translates parallel accessible words into a transmit serial bit stream; and,

a transmit buffer coupled to the data encoder and coupleable to the main processor bus.

2. The telemetry processor as in claim 1 wherein all messages are processed at least partially by the telemetry processor.

3. The telemetry processor as in claim 1 wherein selected messages are processed by the telemetry processor without the main processor.

4. The telemetry processor as in claim 2 wherein the selected messages are processed faster and with less energy than messages processed by the main processor.

5. The telemetry processor as in claim 2 wherein the selected messages are processed when the main processor is inoperative.

6. The telemetry processor as in claim 2 wherein the selected messages are selected from the group consisting of: acknowledgement and negative acknowledgement.

7. The telemetry processor as in claim 1 wherein a handshake message includes a command message and an acknowledgement message.

8. The telemetry processor as in claim 7 wherein the telemetry processor processes the handshake message without main processor assistance.

9. The telemetry processor as in claim 8 wherein the handshake message includes the status of a communications link and status of an implantable medical device.

10. The telemetry processor as in claim 1 wherein an acknowledgement message begins transmission in less than 500 micro seconds after the command message is received.

11. The telemetry processor as in claim 1 wherein the telemetry parameters are configured in the telemetry processor.

12. The telemetry processor as in claim 11 wherein the telemetry parameters are hardware parameters.

13. The telemetry processor as in claim 12 wherein the hardware telemetry parameters are configured in registers.

14. The telemetry processor as in claim 1 wherein the telemetry parameters are firmware parameters.

15. The telemetry processor as in claim 1, further comprising a wake-up detector coupled to the format detector and coupleable to the demodulator to power-up the telemetry processor upon reception of a wake-up burst.

16. The telemetry processor as in claim 15 wherein the telemetry processor is placed in a low power sleep mode until the telemetry processor is activated by a wake-up burst.

17. The telemetry processor as in claim 1 wherein the data decoder is coupleable to the main processor bus to receive protocol control data from the main processor.

18. The telemetry processor as in claim 1 wherein the data encoder is coupleable to the main processor bus to receive status data from the main processor.

19. The telemetry process as in claim 1 wherein when the power source reaches a low power state that causes the main processor to be inoperative, the telemetry processor is still operative.

20. The telemetry processor as in claim 1 wherein the telemetry processor is configured to operate in a direct mode of operation by receiving a message and acknowledging the received message.

21. The telemetry processor as in claim 20 wherein the direct mode is facilitates brief communications between a downlink transmitter and an implantable medical device.

22. The telemetry processor as in claim 20 wherein the downlink transmitter is substantially in motion when the communications link is established.

23. The telemetry processor as in claim 1 wherein the telemetry processor is configured to operate in a session mode of operation by establishing a communications link.

24. The telemetry processor as in claim 23 wherein handshake messages occur periodically to report communications link status between the downlink transmitter and the medical device.

25. The telemetry processor as in claim 23 wherein the downlink transmitter is substantially static while the communications link is maintained.

26. The telemetry processor as in claim 2 wherein the partial processing for received messages includes validating a destination address.

27. The telemetry processor as in claim 2 wherein the partial processing for received messages includes validating a message sequence number.

28. The telemetry processor as in claim 1 wherein the data decoder decodes the received message type.

29. The telemetry processor as in claim 28 wherein the received message type is selected from the group consisting of: application message, handshake message, and waveform acknowledgement message.

30. The telemetry processor as in claim 2 wherein the partial processing for received messages includes deciding whether to transmit an acknowledgement or negative acknowledgement.

31. The telemetry processor as in claim 1 wherein duplicate transmissions of the same command messages are ignored by the telemetry processor.

32. The telemetry processor as in claim 31 wherein multiple executions of the same command message are prevented.

33. The telemetry processor as in claim 1, further comprising a format detector coupled to the data decoder and coupleable to a demodulator to detect the telemetry format being received.

34. The telemetry processor as in claim 1, further comprising a cyclic redundancy check logic coupled to the data decoder to compare a downlink check number against a downlink message to detect whether the downlink message has the correct number of data bit and correct order of the data bits.

35. The telemetry processor as in claim 2 wherein the partial processing for transmitted messages includes inserting header information with an uplink frame sequence generator coupled to the data encoder to add an uplink header to each uplink message containing a source address, destination address, frame sequence number, and status information.

36. The telemetry processor as in claim 2 wherein the partial processing for transmitted messages includes inserting trailer information.

37. The telemetry processor as in claim 36 wherein the trailer information includes a cyclic redundancy check information.

38. The telemetry processor as in claim 1 wherein the medical device is selected from the group consisting of: neuro stimulators, pacemakers, defibrillators, drug delivery pumps, diagnostic recorders, and cochlear implants.

39. A telemetry processor for a medical device, comprising:

means for control logic for operating the telemetry processor according to instruction stored in memory;

means for data decoding coupled to the control logic and coupleable to a demodulator, the data decoder translates a received serial bit stream into parallel accessible words;

means for receiving buffer coupled to the data decoder and coupleable to a main processor bus;

means for data encoding coupled to the control logic and coupleable to a modulator, the data encoder translates parallel accessible words into a transmit serial bit stream; and,

means for transmitting buffer coupled to the data encoder and coupleable to the main processor bus.

40. A telemetry module for an implantable medical device, comprising:

a telemetry coil;

a receiver coupled to the telemetry coil;

a transmitter coupled to the telemetry coil; and,

a telemetry processor coupled to the receiver and the transmitter, the telemetry processor including,

control logic for operating the telemetry processor according to instruction stored in memory,

a data decoder coupled to the control logic and coupleable to a demodulator, the data decoder translates a received serial bit stream into parallel accessible words,

a receive buffer coupled to the data decoder and coupleable to a main processor bus,

a data encoder coupled to the control logic and coupleable to a modulator, the data encoder translates parallel accessible words into a transmit serial bit stream, and,

a transmit buffer coupled to the data encoder and coupleable to the main processor bus.

41. The telemetry module as in claim 40 wherein the receiver comprises a wake-up burst detector, a full-wave telemetry detector, and a baseband filter.

42. The telemetry module as in claim 40 wherein the transmitter comprises an uplink driver.

43. An implantable medical device with a telemetry processor, comprising:

a main processor;

memory coupled to the main processor;

a therapy module coupled to the main process for generating a therapy signal; and,

a telemetry module configured to receive and demodulate an downlink telemetry signal and modulate and transmit an uplink telemetry signal; and,

a telemetry processor including,

control logic for operating the telemetry processor according to instruction stored in memory,

a data decoder coupled to the control logic and coupleable to a demodulator, the data decoder translates a received serial bit stream into parallel accessible words,

a receive buffer coupled to the data decoder and coupleable to a main processor bus,

a data encoder coupled to the control logic and coupleable to a modulator, the data encoder translates parallel accessible words into a transmit serial bit stream, and,

a transmit buffer coupled to the data encoder and coupleable to the main processor bus.

44. A method of processing received telemetry signals in an implantable medical device, comprising:

receiving a serial data stream from a demodulator;

translating the received serial data stream into parallel accessible words;

verifying message integrity;

detecting message type; and,

acknowledging the received message.

45. The method as in claim 44, further comprising receiving a wake-up burst that activates the telemetry processor.

46. The method as in claim 44, further comprising shifting the data stream through cycle redundancy check logic and verifying a complete message has been received by the cycle redundancy check logic.

47. The method as in claim 44, further comprising notifying a main processor if an application message has been received.

48. The method as in claim 44 wherein the acknowledgement is transmitted upon receipt of a complete and validated message.

49. The method as in claim 44 wherein the acknowledgement is a negative acknowledgement transmitted upon receipt of an incomplete and not validated message.

50. The method as in claim 44 wherein the message type is selected from the group consisting of: acknowledgement, negative acknowledgement, application, and waveform.

51. A method of processing transmitted telemetry signals in an implantable medical device, comprising:

selecting the message type to be transmitted with control logic;

adding source and destination address information with an uplink frame generator;

adding status information with control logic;

encoding the transmit message parallel accessible words into a transmit message serial data bits; and,

transferring the message to a modulator for transmission of the message by telemetry.

52. The method as in claim 51, further comprising generating message validity code containing the number of transmit data bits and the order of the transmit data bits with a cyclic redundancy check generator.

53. The method as in claim 51, further comprising notifying the application program that the message has been transmitted.

54. The method as in claim 51, further comprising powering down a telemetry processor after transferring the message to a modulator.

55. The method as in claim 51, further comprising sending a status message from a main processor to the data encoder.